**HP38 Hockey Puck™ non-contact rotary position sensor**

- OEM driven solution with minimum order quantities
- Compact bare bones non-contact rotary encoder
  - Body only 0.69" (17.5mm) tall
- Patented true non-contact position sensing
  - 0.5" (12mm) gap between sensor and application
  - 0.10" (2.5mm) center alignment
  - 30° planar tilt
- Totally sealed IP69k (connector dependent)
- LED indicators for power and output feedback
- Outputs: Quadrature, SSI, Analog, & J1939 Can Bus

### STANDARD OPERATING CHARACTERISTICS

#### ELECTRICAL

<table>
<thead>
<tr>
<th>Outputs</th>
<th>B - PPR - SEPP</th>
<th>Incremental 13 bit Quadrature w/ Single Ended Output</th>
<th>A B Z</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B - 1939</td>
<td>J1939 13 bit @512 positions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B - PWM</td>
<td>PWM absolute position</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B - SSI1</td>
<td>SSI absolute position @512 positions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>V1 Voltage Out / 5 VDC IN, 0-5 VDC OUT</td>
<td>V1 Voltage Out / 5 VDC IN, 0-5 VDC OUT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>V2 Voltage Out / 6-36 VDC IN, 0-5 VDC OUT</td>
<td>V2 Voltage Out / 6-36 VDC IN, 0-5 VDC OUT</td>
<td></td>
</tr>
<tr>
<td>Input Power</td>
<td>6 to 30 VDC at approx 60 mA max, <strong>not including output loads</strong></td>
<td>6 to 30 VDC at approx 60 mA max, <strong>not including output loads</strong></td>
<td></td>
</tr>
<tr>
<td>Electrical Protection</td>
<td>Over-voltage, reserve-voltage, output short-circuit protected</td>
<td>Over-voltage, reserve-voltage, output short-circuit protected</td>
<td></td>
</tr>
<tr>
<td>LED Indicators</td>
<td>Power and output channels</td>
<td>Power and output channels</td>
<td></td>
</tr>
<tr>
<td>Resolution</td>
<td>0.3°</td>
<td>0.3°</td>
<td></td>
</tr>
<tr>
<td>Repeatability</td>
<td>U.3u%</td>
<td>U.3u%</td>
<td></td>
</tr>
<tr>
<td>Nonlinearity</td>
<td>&lt;1%</td>
<td>&lt;1%</td>
<td></td>
</tr>
</tbody>
</table>

#### MECHANICAL

*Non-contact tolerances rated using MAGH-RING 1/4x20 magnet accessory.*

- Housing Diameter: 38mm
- Housing Material: Black Delrin™ (standard)
- Housing Height: 0.69" (17.5mm) body
- Mounting: 32mm (.884) spacing w/ 4mm diameter screws
- Weight: 1.3 oz
- Magnet / sensor gap*: Standard 0.5" (12mm) (Max w/ custom mag assembly up to 1" [30mm])
- Rated planer tilt / axial gap*: Planar 30° (Max 45°) / Axial 0.1" (2.5mm) (Max 0.16" [4mm])
- Speed: 3000 RPM max

#### ENVIRONMENTAL

- Operating Temperature: -30°C to +80°C
- Storage Temperature: -40°C to +90°C
- Humidity: 100%
- Shock: 400g/6ms (MIL STD 202)
- Vibration: 5 to 3000 Hz, 20g (MIL STD 202)
- Protection Class: IP69K (connection dependent)

General ordering guide found on next page (St ; 14 / 2)
**HP38 General Ordering Guide**

Build part number first by selecting **Housing Style** (code 1), **MagElec** (code 2), and **Connection** (code 3). Add **Special Codes** (code 4) to the end of the Joral part number. Refer to ‘Special Part Number Information’ for explanation of modifiers.

**Examples:**
- HP38-B-0256-SEPP-M12P - Black Delrin™ (HP38), M12 pigtail (M12P), 10 bit incremental quadrature @256 ppr
- HP38-B-1939-SC72 - Black Delrin™ (HP38), 72” shielded cable, 10 bit J1939 @ 1024 positions
- HP38-V1-0-360-0.5-4.5-CW-C72 - Black Delrin™ (HP38), 72” cable (SC72), 0-5v Voltage Out (V1) @0-360º, 0.5-4.5v out, clockwise signal

**Code 1: Housing Style**
- HP38 - HP38 material black Delrin™, connector orientation SIDE EXIT. For REAR EXIT connector on HP38 add code 33 to end of P/N.

**Code 2: MagElec (Sensor Output)**
- B - _____ - SEPP - 13 bit single ended quadrature - A B Z
- B - 1939 - 13 bit J1939 @512 positions
- B - SSI1 - Absolute position SSI @512 positions
- B - PWM - PWM absolute position

**Code 3: Connection**
- TRM - Pluggable terminal block
- M8 - M8 male
- M12P - M12 male on 18’ pigtail
- CXX - Flying lead cable (enter XX as inches)
- DE4 - DT04 - 4 pin male Deutsch
- DE6 - DT04 - 6 pin male Deutsch

**Code 4: Special Codes**
- 31 - Side Exit (housing wall)
- 33 - Back Exit (epoxy side)
- 71 - Roller
- 72 - Spindle

**Special Part Number Information** Review below code sections for important P/N build information

**Code 1: Housing Style**
- **Modifer 33** - For REAR EXIT connector orientation on HP38 add 33 to end of Joral P/N.
- **HP38** - Standard connector orientation SIDE EXIT. For rear exit add modifier 33 to end of Joral P/N.

**Code 2: MagElec**
- **B - _____ - SEPP**
  - Enter Quadrature PRin place of _____
  - B = 10 bit PPR
  - Available 10 bit PPR: 0032, 0064, 0128, 0256
  - B - 1939 - 10 bit J1939 output is 512 positions
  - B = 10 bit

**Code 3: Connections**
- **V1, V2, and I1** (Analog MagElec P/N Guide)
  - First select MagElec code (V1, V2 or I1) then Angle Range (A1-A2), Voltage Range (V1-V2) and Signal Direction (Clockwise [CW] or Counter [CCW])
  - PART NUMBER FORMULA (MagElec)-(A1-A2)-(V1-V2)-(CW or CCW)
  - EXACT V1, V2, and I1 EXAMPLES
    - HP38 - V1 - 0-360 - 0.5-4.5 - CW - C72
    - HP38 - V2 - 0-180 - 0-5 - CCW - C72
    - HP38 - I1 - 180-270 - 4-20 - CW - C72

**Code 4: Special Codes**
- *More outputs and connection options available, contact Joral if desired configuration is not listed*
**HP38 Dimensions & General Pin-outs**

**HEX ADJUSTABLE MAGNET DETAIL (FACE VIEW)**

1. BRN = +VDC (VIN)
2. WHT = CHANNEL B
3. BLUE = COMMON/GROUND
4. BLK = CHANNEL A
5. GRY = CHANNEL Z

**DISTANCE DEPENDANT ON MOUNT MATERIALS**

**HEX ADJUSTABLE RING APPLICATION MAGNET**

**NOTE:**
- MAGNETIC MOUNTS MUST HAVE 1" DIAMETER HOLE ON CENTER.
- NON-MAGNETIC MOUNTS MAY BE SOLID.
- MOUNT WITH 316 STAINLESS STEEL 6-32 SCREWS.

**M12-5P Male Face View**

- 1 = BRN = +VDC (VIN)
- 2 = WHT = CAN HIGH
- 3 = GRN = CAN LOW
- 4 = RED = +VDC (VIN)
- 5 = BLK = COMMON/GROUND

- 1 = YEL = CAN HIGH
- 2 = GRN = CAN LOW
- 3 = RED = +VDC (VIN)
- 4 = BLK = ADDRESS GROUND
- 5 = WHT = ADDRESS PROG. RESISTOR
- 6 = BLK = COMMON/GROUND

**M12-5P/CABLE/FLYING LEAD QUADRATURE OUTPUT**

1. BRN = +VDC (VIN)
2. WHT = CAN HIGH
3. RED = +VDC (VIN)
4. BLUE = COMMON/GROUND
5. BLACK = CHANNEL A
6. GRAY = CHANNEL Z

**M12-5P/CABLE/FLYING LEAD PROPORTIONAL (ANALOG) OUTPUT**

1. BRN = +VDC (VIN)
2. WHT = DIG. LIMIT OUT
3. BLUE = COMMON/GROUND
4. BLK = PROP. VDC OUTPUT
5. GRY = NOT USED

**NOTE:**
- MAGNETIC MOUNTS MUST HAVE 1" DIAMETER HOLE ON CENTER.
- NON-MAGNETIC MOUNTS MAY BE SOLID.
- MOUNT WITH 316 STAINLESS STEEL 6-32 SCREWS.

**Dimensions informative only**

For most recent dimensions please consult factory